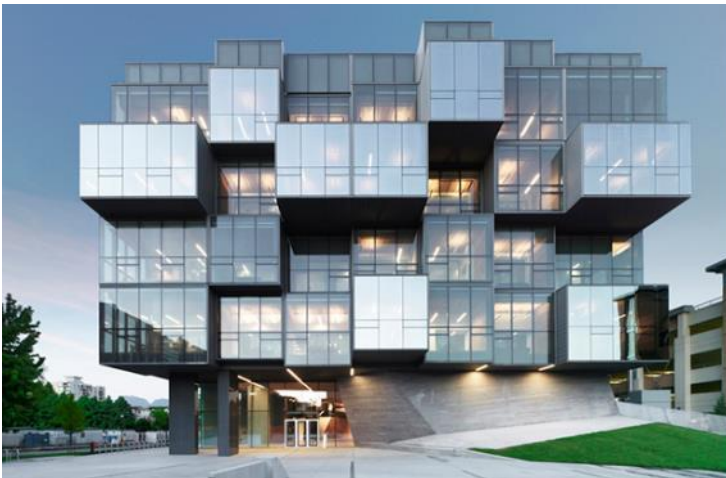


Green Buildings at the University of British Columbia



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Penny Martyn,
Green Building Manager
Architect-AIBC, LEED AP

An aerial photograph of a suburban town. On the left, a river flows along the edge of the town. The town itself is a dense grid of residential streets with many houses and some larger commercial buildings. To the right of the town, there is a large, dark green forested area. A road runs along the boundary between the town and the forest.

Agenda

- Vision
- Status
- Green Building Strategies

Vision for Green Buildings

C&CP vision:

“Pursue regenerative buildings, landscapes, and neighbourhoods that create a healthy, resilient and animated learning environment.”



UBC Institutional Buildings

C.K Choi Building

- Completed 1996
- 30,000 ft²
- Early green building



C.K. Choi Building
Matsuzaki Wright

UBC Renew Program



Chemistry Renew

- Completed 2008
- 77,000 ft²
- Historic features restored, systems renewed



Centre for Interactive Research on Sustainability

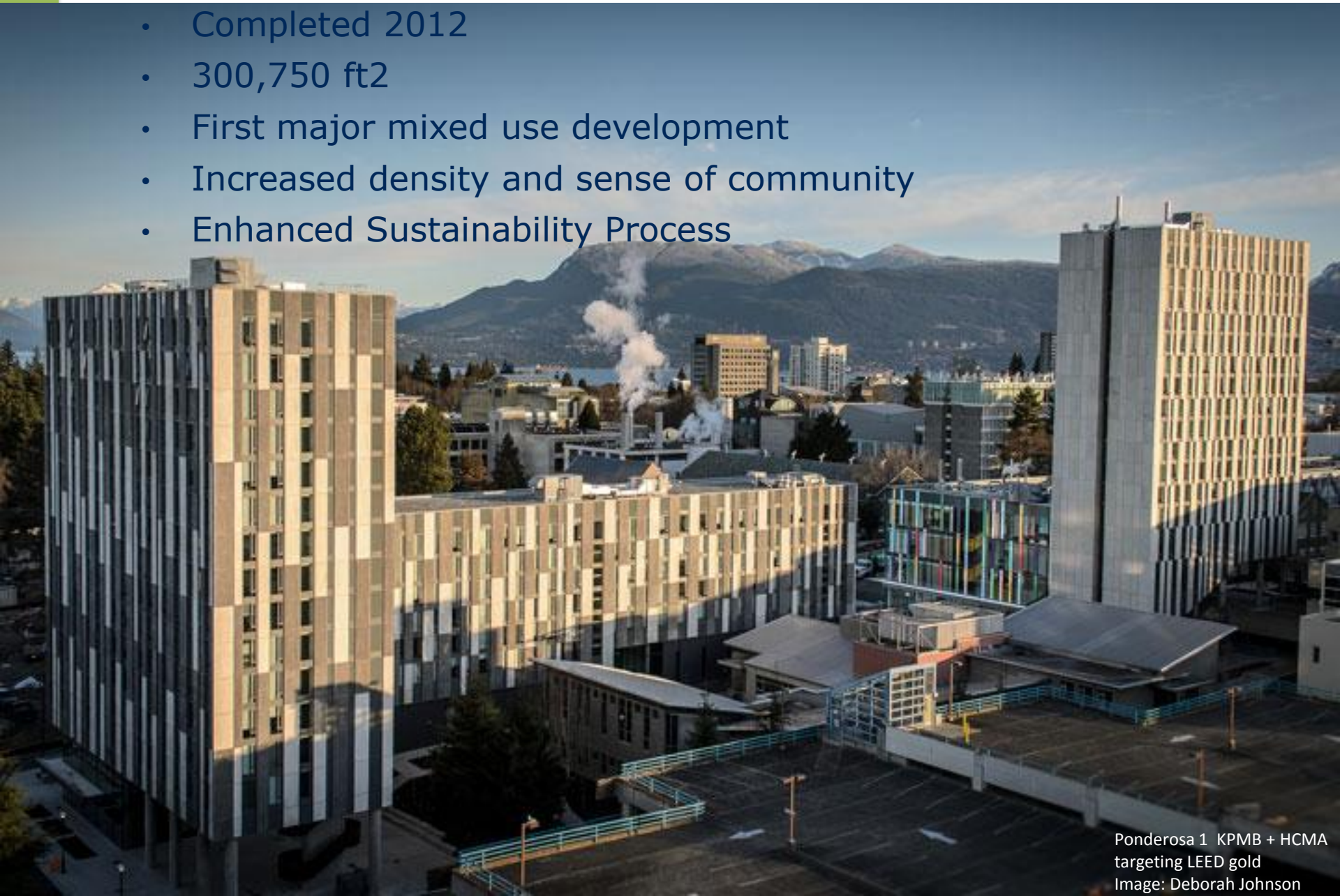
CIRS P+W
LEED Platinum
targeting Living Building Challenge (partial)



- Completed in 2011
- 48,620 ft²
- LEED platinum
- Attempting net positive:
 - energy
 - water
 - human happiness, productivity and health

Ponderosa Housing Hub Phase 1

- Completed 2012
- 300,750 ft²
- First major mixed use development
- Increased density and sense of community
- Enhanced Sustainability Process



Pharmaceutical Sciences and Centre for Drug Research & Development Building

- Completed 2014
- 246,180 ft²
- Governor General's Award



Student Union Building - "The Nest"



Image courtesy Dialog

- Planned completion 2015
- 253,750 ft²
- Targeting LEED platinum
- Students demanded sustainable design and healthy materials

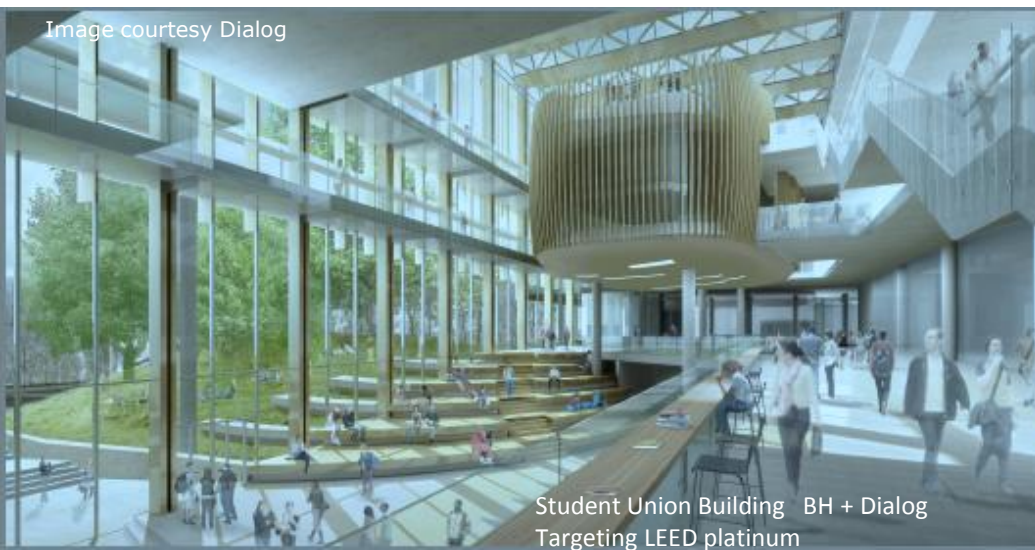


Image courtesy Dialog

Student Union Building BH + Dialog
Targeting LEED platinum

Orchard Commons- Vantage College

- Planned completion 2017
- 401,567 ft2, mixed use development
- 1000+ student residence rooms and academic space
- Enhanced Sustainability Process



Institutional Green Building Ratings

- In 2007, B.C. committed that all new public sector buildings or major renovations must target LEED Gold certification

| Number of projects Campus New Construction and Major Renovations | | |
|---|-----------------|------------------------------|
| LEED certified | LEED registered | Claiming LEED Equivalency |
| 10 | 15 | 9 |



Residential Buildings

1. Residential buildings

2. Commercial buildings

3. Industrial buildings

4. Public buildings

5. Educational buildings

6. Healthcare buildings

7. Government buildings

8. Religious buildings

9. Entertainment buildings

10. Other buildings

Dahlia and Magnolia Buildings

- Completed 2012
- 106,000 ft²
- Faculty and staff housing developed by UBC Properties Trust



Sail

- Completed 2013
- 156,450 ft²
- First REAP platinum
- Selling “green” features
- First 6 storey wood building

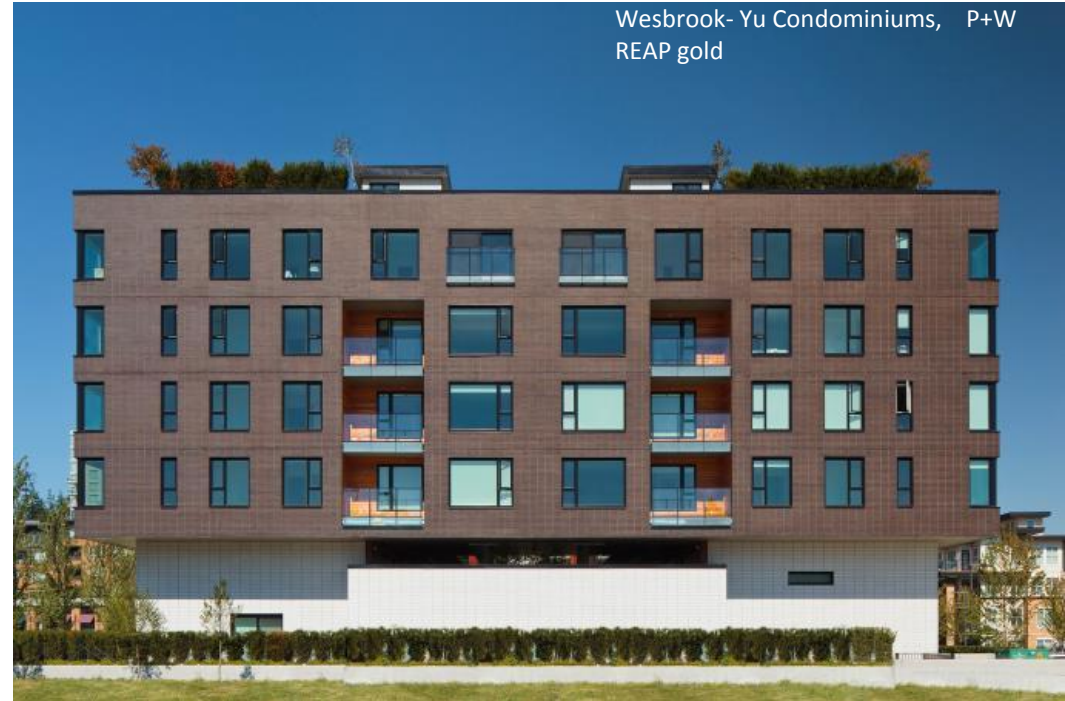


Sail Rositch Hemphill
REAP platinum

Yu and Axis



Axis, Raymond Letkeman
REAP gold



Wesbrook- Yu Condominiums, P+W
REAP gold

Yu condominiums

- Complete 2013
- 105,000 ft²
- courtyard design for natural ventilation

Axis condominiums

- Complete 2013
- 103,899 ft²
- high-rise

Residential Green Building Ratings

| No of REAP projects | | | | |
|---------------------|----------|------|----------------------------|---------------------------|
| certified | platinum | gold | Occupied but not certified | Claiming REAP equivalency |
| 22 | 1 | 10 | 4 | 6 |

- In 2009 residential projects were mandated to achieve REAP gold certification
- REAP 2.1 is barely code compliant for energy, need REAP 3.0 to be passed by the Board of Governors



Current strategies and future plans

- **Current strategies**
 - **Prevention**
 - **Primary prevention**
 - **Screening**
 - **Colonoscopy**
 - **Flexible sigmoidoscopy**
 - **CT colonography**
 - **Stool-based tests**
 - **Fecal occult blood test (FOBT)**
 - **Fecal immunochemical test (FIT)**
 - **Multi-target stool DNA test (MT-SNT)**
 - **Endoscopy**
 - **Colonoscopy**
 - **Flexible sigmoidoscopy**
 - **Secondary prevention**
 - **Surveillance colonoscopy**
 - **Surveillance sigmoidoscopy**
 - **Surveillance stool-based tests**
 - **Treatment**
 - **Chemoprevention**
 - **Aspirin**
 - **Statins**
 - **Calcium**
 - **Vitamin D**
 - **Chemotherapy**
 - **5-Fluorouracil (5-FU)**
 - **Oxaliplatin**
 - **Irinotecan**
 - **Targeted therapy**
 - **EGFR inhibitors**
 - **VEGF inhibitors**
 - **HER2 inhibitors**
 - **Immunotherapy**
 - **PD-1 inhibitors**
 - **CTLA-4 inhibitors**
 - **Future plans**
 - **Prevention**
 - **Primary prevention**
 - **Screening**
 - **Colonoscopy**
 - **Flexible sigmoidoscopy**
 - **CT colonography**
 - **Stool-based tests**
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 - **PD-1 inhibitors**
 - **CTLA-4 inhibitors**

Current Green Building Strategies

Climate Action Plan

- Overriding policy

Institutional Buildings

- Process
 - Enhanced sustainability process
 - Development Review Process
- Policies
 - Campus Guidelines
 - Technical Guidelines
 - LEED Implementation Guide
 - LEED equivalency (in development)
- Healthy building materials and transparency

Residential Buildings

- Process:
 - Development Review Process
- Policies:
 - REAP

GHG Emission-UBC Climate Action Plan



Reduction Targets

Provincial carbon offset required
UBC adopted its Climate Action
Plan in 2010:

33% below 2007 levels by 2015

67% below 2007 levels by 2020

100% below 2007 levels by 2050



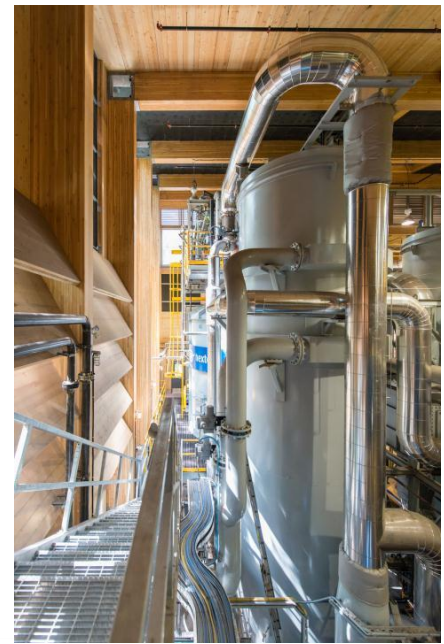
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GHG Emissions and UBC Climate Action Plan

2015 Target

- Three key projects will achieve the 33% reduction:
 - Steam to Hot Water Conversion (22%)
 - Continuous Optimization (10%)
 - Bioenergy Research and Demonstration Facility (9%)



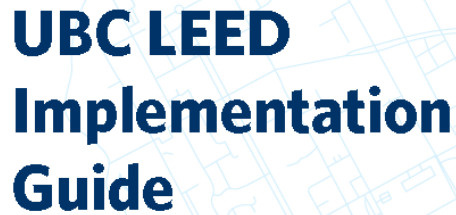
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Enhanced Sustainability Process

| | |
|--|--|
| 5 steps | |
| Design Brief | Social, economic and environmental goals e.g. Energy use intensity target |
| Project start up meeting | |
| Environmental sustainability charettes | <ul style="list-style-type: none">• Energy modeling workshop• Environmental sustainability charette |
| Report on project targets | Consultant report |
| Board 4 report | Report back on project design goals |

UBC LEED Implementation Guide



UBC LEED Implementation Guide

for LEED Canada Building Design +Construction 2009

January 2013

campus + community planning



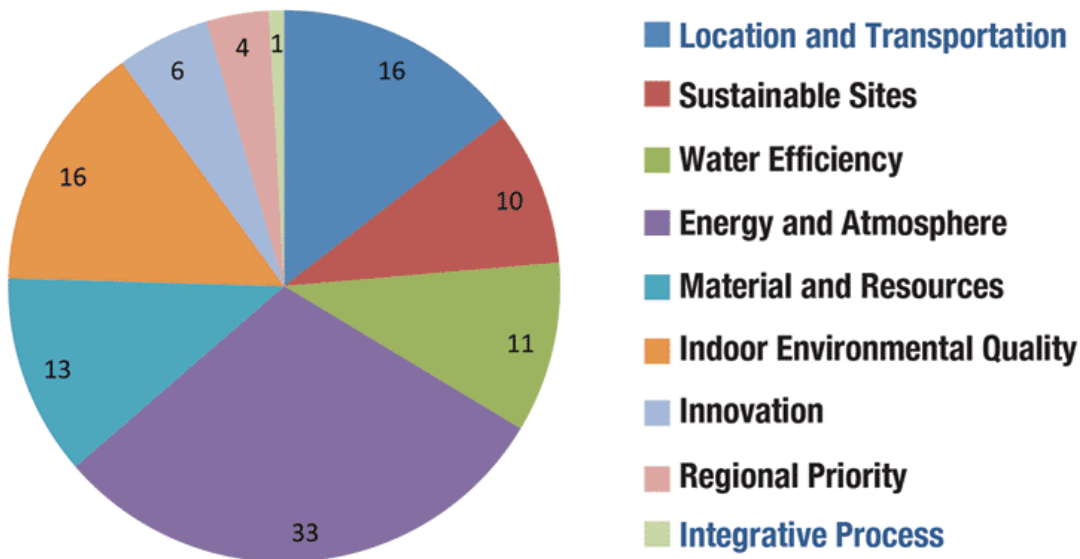
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- Guidance for project teams
- Layered over LEED gold certification, mandatory credits at UBC
- Goal to improve outcomes and help project teams
- LEED v4 mandatory in June 2015

LEEDv4: LCA related credits

| | |
|---|------------------|
| Building Life-Cycle Impact Reduction | 5 credits |
| Building Product Disclosure and Optimization -EPD | 2 credits |
| Building Product Disclosure and Optimization- Sourcing of Raw Materials | 2 credits |
| Building Product Disclosure and Optimization - Materials Ingredients | 2 credits |
| Construction and Demolition Waste | 2 credits |



LEED v4 –Building life Cycle Impact Reduction

Whole-building life-cycle assessment

For new construction (buildings or portions of buildings), conduct a life-cycle assessment of the project's structure and enclosure that demonstrates a minimum of **10% reduction**, compared with a baseline building, in at least three of the six impact categories listed below, one of which must be global warming potential. No impact category assessed as part of the life-cycle assessment may increase by more than 5% compared with the baseline building.

1. *Global warming*
2. *Ozone-layer depletion*
3. *Acidification*
4. *Eutrophication*
5. *Formation of ground-level ozone*
6. *Depletion of non-renewable energy resources*





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